like and masterful views of women's powers
and privileges. Women, he thought, ought
to have every thing provided for them, and
every trouble taken off their hands : so the less
they meddled with business in any form, the
better. But these very young notions gave
way, as he saw more of life, to wiser and more
practical ones. He found that women were
not utterly helpless ; and his love of justice,
combined with his better opinion of their pow-
ers, made him quite willing to concede to them
as much as he would have desired for himself;
namely, full scope and opportunity for the ex-
ercise of all their faculties. This was shown
by his giving lectures gratuitously in the Ladies'
college for the first year after its foundation,
and by the interest he felt in the success of
those brave women who first attempted the
study of medicine."

De Morgan's letters are of a kind which it is
very interesting to receive at the natural inter-
vals at which they are written. When taken
en masse, the logico-mathematical language
in which they are couched, amusing in small
doses, and their wit, excellent but monoto-
nous, become wearisome. It is too much like
sitting down to a continuous reading of the
Budget of paradoxes.

In regard to his ideas on religion, De Mor-
gan was always extremely reticent ; but in
spite of the disastrous effect of his early train-
ing, and in spite of his strong aversion to un-
founded beliefs, he preserved a deeply religious
tone of mind, and a firm faith in the Christian
religion. At the same time, nothing could be
more frank and uncompromising than the way
in which he meets the renewed insistance of
his mother, upon the occasion of the death of
a sister to whom he was much attached, that
he should renounce his freedom of opinion.
His letter, if somewhat severe and untender,
is still a splendid example of that strong rec-
titude of mind which was characteristic of
him, and which did not permit him to gain
any thing, even family harmony, at the cost of
concealment.

The last years of De Morgan's life were
years of disappointment and grief. The uni-
versity in which he had labored with untiring
energy until the age of sixty became once more
impossible to him. The reiterated pledges of
its founders and subsequent directors, that the
essence of its being should be absolute and
complete religious equality in every portion
of its organization, were broken ; and De Mor-
gan could not lend his countenance to a less
liberal or a more worldly line of policy. Upon
the refusal of the council to appoint to the

chair of mental philosophy and logic the Rev.
James Martineau, who had been recommended
by the senate on account of his wide reputa-
tion as a preacher of an unpopular sect, De
Morgan once more handed in his resignation.
A year later occurred the death of his second
son, George, a young man of great mathe-
matical promise, and one of the two first pro-
jectors of the present Mathematical society.
From this time De Morgan's health and vigor
were not what they had been ; and after an
attack of congestion of the brain, from which
his recovery was slow, he died in 1871 of ner-
vous prostration.

WHITE'S FOSSIL MOLLUSKS OF NORTH AMERICA.

A review of the non-marine fossil Mollusca of North
America. By C. A WHITE. Washington, *Gov-*
ernment printing-office, 1883. 1, 144, 3 p., 32 pl.
sm. f°. [Annual report U. S. geological survey,
1881–82, *separately paged.*]

No work is more useful to the biologist,
whether his studies relate to recent or to fossil
forms, than the collection and careful illustra-
tion of scattered material. In the book under
consideration, Dr. White has produced for the
student of mollusks, in either their recent or
their paleontological relations, a much-needed
and permanently valuable work of reference.
Owing to their wide range, fecundity and ac-
cessibility, the class of mollusks included under
his title are, all over the world, better known,
more thoroughly studied, and more easily col-
lected, than those of the sea. Hence it is to
be expected that the material for learning what
lessons they have to teach will be available for
students much sooner with the land and fresh-
water mollusks than with the marine species
considered as a class. Publications such as
this, perhaps more than any other single means,
will serve to shorten the time which must elapse
before such a condition of the science is reached.
Stratigraphical paleontology will not be so much
the gainer as biology in a wider sense, since
the uniformity of lacustrine and fluviatile con-
ditions interferes with that differentiation which
makes of some groups of marine mollusks valu-
able indices of geological time.

Dr. White has brought together excellent
figures of nearly all the species of the groups
under consideration belonging to North Ameri-
can paleontology, from the oldest strata in
which they are known, to and including the
miocene tertiary. One doubtfully pliocene spe-
cies is mentioned ; but the fossils of the later
marls, and such deposits as that of the Colorado

desert, are not considered. Most of these are known as recent shells also ; but we think it would have been a useful addition to the collection if such extinct forms as Tryonia had been included.

To the catalogue in tabular form and the explanation of the plates are prefixed a statement of the object and method of the work, a *résumé* of the subject by zoölogical families, and some general considerations. In these last the author, we think, is the first to enunciate certain propositions, which, though simple, constitute an important advance over previous statements of the general topic. In brief, he points out the high probability that lacustrine, at first brackish-water forms, were derived from marine species by imprisonment due to rising seashores, forming, first estuaries, then lakes ; afterward differentiated so as to become inured to water without salt, or, in other cases, exterminated by water too fresh, or in lakes without an outlet, by concentration of saline matters. This view is not wholly novel ; but the author goes on to supplement it by pointing out how, from the gradual conversion of lakes into rivers, and the persistence of the latter through epochs of geological change, the remarkable persistency of fluviatile types is accounted for, and problems of present geographical distribution may be solved.

Too much space would be required for an analysis of the work in detail : a few points have been noted for mention. It seems a little startling to have oysters, Anomiae, and mussels presented as non-marine, until we learn that they were of the peculiar brackish-water beds in the Laramie group, and were doubtless accustomed to almost lacustrine conditions. The oldest forms treated of are Naiadites and certain supposed Anodontae from the Devonian (the latter much suggesting in appearance Lithodomus and its allies) ; but if these were not, as is supposed, true fresh-water folk, then the earliest of the latter date from the trias. Six families of Conchifera, in all, and sixteen of Gastropoda, are represented in the catalogue. It might be suggested that an analogue of Unio belliplicatus may, perhaps, be found living in Nicaragua, and that Cerithidea lives rather abundantly on the Californian coast.

The proof-reading of this volume is not up to the usual standard of the Government printing-office, and the index is disappointingly meagre. The arrangement of the numbers to figures on the plates is confused and puzzling : it can hardly fail to cause a serious loss of time to those who consult them. On the other hand, the paper and press-work are above the average, and the execution of the figures unusually good.

WEEKLY SUMMARY OF THE PROGRESS OF SCIENCE.

GEODESY.

Geodetic night-signals. — Mr. C. O. Boutelle, of the U. S. coast-survey, finds that the magnesium light as used by the survey may be used for distances as great as forty-five to seventy miles, and that the ordinary student-lamp with a parabolic reflector may be seen as far as forty miles. A report on night-signals was published by the coast-survey last year. The advantages stated in the report, as derived from greater steadiness of the atmosphere, and comparative freedom from lateral refraction upon long lines of sight during night observations, have been signally verified during the seasons of 1881 and 1882. — (*Rep. U.S. coast geod. surv.*, 1880.) **[859**

MATHEMATICS.

A definite integral. — In a brief note, M. Korkines gives a simple proof of a theorem due to M. Tchébychef. The theorem relates to the integral $\int_0^1 \phi(x)\,\psi(x)\,dx$, where ϕ and ψ must satisfy one of the two conditions: 1°, they simultaneously increase or simultaneously decrease for all values of x lying between zero and unity; 2°, or one of them must increase and the other decrease for the same values of x. In the first case, M. Tchébychef's theorem is

$$\int_0^1 \phi(x)\,\psi(x)\,dx > \int_0^1 \phi(x)\,dx \int_0^1 \psi(x)\,dx\,;$$

in the second case,

$$\int_0^1 \phi(x)\,\psi(x)\,dx < \int_0^1 \phi(x)\,dx \int_0^1 \psi(x)\,dx.$$

M. Korkine makes these theorems the immediate consequence of a simple identity. — (*Comptes rendus,* Jan. 29.) T. C. **[860**

Linear differential equations. — In a previous communication to the academy, M. Goursat has solved, for a special class of equations, the problem to find the entire number of substitutions to which a system of fundamental integrals of a given equation may be subjected, corresponding to all the different closed paths which the variable may describe. The general integral in that case was shown to be expressed by hypergeometric series of higher orders. In the present paper, M. Goursat develops more fully his method, and applies it to the equation of the third order, remarking that the method followed is identically the same for equations of any order. — (*Comptes rendus,* Jan. 29.) T. C. **[861**

Functions of two independent variables. — M. Picard has given a series of notes upon this subject, determining the functions of two independent variables, u and v, which remain invariable when we effect upon u and v any of the infinite number of substitutions of a linear discontinuous group. In the present paper M. Picard considers, in a general